

# **CITY OF CHULA VISTA**

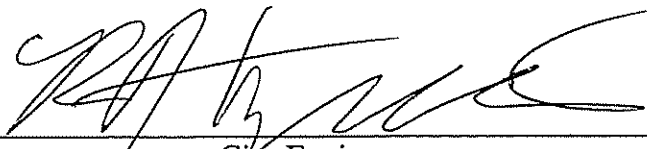
## **STANDARD SPECIAL PROVISIONS**

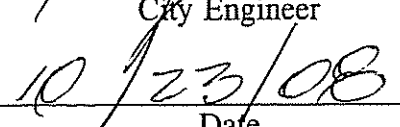
**OCTOBER 2008**

**For use with the APWA/AGC "Greenbook"  
Standard Specifications for  
Public Works Construction  
2006 Edition**

**and**

**Regional Supplement Amendments  
Approved and Adopted by the  
San Diego Regional Standards Committee  
2006 Edition**

  
\_\_\_\_\_  
City Engineer

  
\_\_\_\_\_  
Date



**2-9 SURVEYING**

**2-9.3 Private Engineers, Add:**

- (p. 13) For work done under private contracts, (i.e. permits and land development) or City Capital Improvement Projects, the contractor, if responsible for surveying services, shall do so under the following conditions:
- a) All provisions of Section 8771(b) of the Professional Land Surveyors' Act (Business and Professions Code) shall be adhered to.
  - b) Contractor shall retain the services of a Land Surveyor or Civil Engineer licensed to practice land surveying in the State of California to perform all work under this section.
  - c) All existing surveying monuments in and around the work area shall be clearly identified prior to the beginning of construction. A list of the monuments identified must be made available to the City for verification. Monuments may exist which are not shown on the plans. The contractor must make every effort to preserve existing surveying monuments. Where this is not possible, or where any monuments are destroyed by the contractors negligence, they must be replaced by the Land Surveyor or Civil Engineer and a Record of Survey in conformance with the Land Surveyor's Act filed in the office of the San Diego County Recorder. A Corner Record may be filed at the discretion of the City Surveying Group. A copy of the record of Survey or Corner Record must be made available to the City Surveying Group for review, correction and approval prior to being sent for recording.

**3-3 EXTRA WORK**

**3-3.2.3(a) Work done by Contractor**

- (p. 17) Mark-up percentages to be added to the cost of extra work performed by contractor are as follows:

1)	Labor	10%
2)	Material	5%
3)	Equipment	5%
4)	Other items and expenditures	5%

**3-3.2.3(b) Mark-up - Work done by the Subcontractor**

- (p. 17) A mark-up of 5% on the first \$5,000 and 2 1/2% on work added in excess of \$5,000 of the subcontracted portion of the extra work.

**7-10.1.1 PUBLIC CONVENIENCE AND SAFETY**

(p. 32)

7-10.3.2 To Regional Supplement

(p. 4) Traffic Plate Bridging

As required by the City, steel plate bridging and shoring shall be installed using either Method (1) or (2):

Method 1 [For speeds 45 mph and greater]

The pavement shall be milled to provide a depth equal to the thickness of the plate and to the width and length required to recess the plate such that it is flush with the surrounding pavement surface.

Method 2 [For speeds of 40 mph and less]

Approach plate(s) and ending plate (if longitudinal placement) shall be attached to the roadway by a minimum of two (2) dowels installed in pre-drilled holes into the corners of the plate and drilled a minimum two (2) inches into the pavement. Subsequent plates are butted to each other, and tack welded as directed by the Engineer. Fine graded asphalt concrete shall be placed and compacted to form ramps, maximum slope 8.5% with a minimum 12" taper to cover all edges of the steel plates. When steel plates are removed, the pavement shall be restored as required by the Engineer.

The contractor is responsible for the maintenance of the plates, shoring, asphalt concrete ramps, and ensuring that they meet the minimum specifications. The contractor shall provide all necessary traffic controls including advance-warning sign indicating that steel plate bridging is in use, the signs shall include the contractors name and an emergency telephone number. Unless specifically noted in the special provisions, or approved by the engineer, use of steel plate bridging should not exceed 50 lf. or exceed 4 consecutive working days in any given week.

All steel plates within the right of way whether used in or out of the traveled way shall be without deformation. Any plate found to be permanently deformed shall be rejected and removed from the right of way.

Steel plates used in the traveled way shall have a surface that was manufactured with a nominal Coefficient of Friction of 0.35 as determined by California Test Method 342.

**203-6 ASPHALT CONCRETE MIXTURES**

**203-6.3.3 Composition and Grading, Delete 2nd paragraph and add:**

(p. 81) a) Submittals

The Contractor shall submit a Job Mix Formula (JMF) and mix verification data for review by the City for each source of supply and type of mixture specified. The JMF shall indicate the percentage aggregate passing each specified sieve size and the percent paving asphalt to be used for each asphalt concrete mixture incorporated in the work.

b) Composition

Mix verification shall consist of the laboratory mix design report (less than twelve months old) that is the basis of the JMF (California Tests 366 and 367). Provide the source of the mix materials and evidence of the physical properties for the asphalt (CalTrans Standard Specifications, Section 92) and aggregates (Paragraph 203-6.3.3 of this specification). Optimum Bitumen Content (OBC) shall be determined in accordance with California Test 367. The Contractor shall submit the mix design report to the Engineer a minimum of five (5) working days prior to paving.

When requested by the Engineer, Contractor shall submit a Quality Control Plan describing the processes and procedures that will be followed at the plant and the project site to assure consistency in meeting the project specification requirements.

c) Gradation

The aggregate and paving asphalt portions of the mixture produced shall not vary from the JMF by more than the tolerances, which follow, but in any case the allowed tolerance is also restricted to conform to the master grading ranges. The material properties shall meet the requirements of these specifications.

Sieve Size	Percent by Weight
No. 4 and larger	+/- 6
No. 30	+/- 5
No. 200	+/- 3.0
Paving Asphalt Material	+/- 0.45

**203-6.4.4 Sampling and Testing, Add:**

The Engineer shall have the right to obtain samples of all materials to be used in the work and to test such samples for the purpose of determining specification compliance. The primary sampling point by the Engineer will be at the project from the mat, prior to rolling. Other testing may be at the job site, plant or in trucks as determined by the Engineer. All sampling and testing shall be in accordance with California Test 125 or other methodology approved by the City Engineer.

The aggregate and mix to be incorporated into the work shall conform to the following quality requirements:

Test	Test Results
<b>Mix Design</b>	
Loss in L.A. Rattler per California Test 211 (after 500 revolutions)	45% Max
Sand Equivalent per California Test 217	50, Min.
Stabilometer Value per California Test 366	35, Min.
Swell per California Test 305	0.030" Max.
Air Void Content (mix) per California Tests 304, 308, and 367	4.5% +/- 1.5%
Air Void Content (mix) per ASTM D2041	Report Only
<b>In-Place Asphaltic Concrete</b>	
Stabilometer Value per California Test 366	35, Min. *
Gradation and Asphalt Content	Per Section 400-4.3
In-Place Density based on Maximum Theoretical Specific Gravity as determined by ASTM D 2041	92% to 96%
Air Voids Content (mix) per ASTM D2041	3% to 6%

\* Each Stabilometer test result shall be the average of at least three (3) specimens. No test result (average of at least three (3) specimens) from a single day's production shall be less than 30.

The initial sampling and testing of in place asphalt concrete will be at no cost to the Contractor, except for the cost of material and restoration and damage by testing. If the Contractor is to provide and pay for testing, the Specifications will so state. For private contracts, the testing expense shall be borne by the permittee.

## **207-2      Reinforced Concrete Pipe**

### **207-2.1      General, Add:**

(p. 121)      Unless otherwise specified, the "D" load rating of all concrete pipe used within the street right of way shall be equal to a "D" loading of at least 1500.

## **207-11      Corrugated Metal Pipe and Pipe Arches (Steel)**

### **207-11.1      General, Add:**

(p. 145)      All corrugated steel pipe shall be coated and paved per Sections 207-11.5.2, Coatings, and 207-11.5.4, Paving.

The gauge of sheets, unless otherwise specified, shall conform to the following:

Pipe Diameter	Gauge No.
8" to 21" inclusive	16
24" to 30" inclusive	14
36" to 54" inclusive	12
60" to 72" inclusive	10
78" to 96" inclusive	8

**207-13      Corrugated Aluminum Pipe and Pipe Arches**

**207-13.1      General, Add:**

(p. 151)      The gauge of sheets, unless otherwise specified, shall conform to the following:

Pipe Diameter	Gauge No.
8" to 21" inclusive	16
24" to 30" inclusive	14
36" to 54" inclusive	12
60" to 72" inclusive	10
78" to 96" inclusive	8

**211      SOILS AND AGGREGATE TESTS**

**211- 1.2      Field Density, Delete paragraph and add:**

(p.185)      Field density of soil shall be determined in accordance with ASTM D1556, ASTM D1557, ASTM D2922, or as directed by the Engineer.

**302-5      ASPHALT CONCRETE PAVEMENT**

**302-5.5      Distribution and Spreading, Revise the sixth paragraph to read as follows:**

(p. 237)      The depositing, distributing, and spreading of the asphalt concrete shall be accomplished in a single, continuous operation by means of a self propelled mechanical spreading and finishing machine designed specially for that purpose. The machine shall be equipped with a screed capable of being accurately regulated and adjusted to distribute a layer of the material to a definite predetermined thickness. The screed shall be able to extend from 8 to 18 feet per the manufacturers recommendations. The screed shall be equipped with a 2-foot wide cut-off shoe to allow the paver to operate between 8 feet and 18 feet wide. Hydraulic wing extensions are not considered to be a screed. All screed extensions shall be similar to a Blaw-Knox Omni screed that when extended shall consist of all screed components (screed plate, strike off plates, heater and vibrator). The

Engineer shall select joint locations and pavement widths based upon the capabilities of the specified screed. When paving is of a size or in a location that use of a self-propelled machine is impractical the Engineer may waive the self-propelled requirements. The type of machine (make and model) shall be submitted to the Engineer one week prior to commencement of paving operations. The Engineer shall be given the opportunity to inspect the paving machine prior to commencement of paving operations. The manufacturer's operation manual for the machine shall be made available for review upon request of the Engineer.

Asphalt paving equipment shall be equipped with automatic screed controls, a sensing device or devices and a ski device. The minimum length of the ski device shall be 30 feet. The ski device shall be a rigid one-piece unit and the entire length shall be used in activating the sensor or sensors.

When placing asphalt to the lines and grades established by the Engineer, the automatic screed controls shall control the longitudinal grade and transverse slope of the screed. Grade and slope references shall be furnished, installed and maintained by the Contractor.

When placing the initial mat of asphalt concrete on existing pavement, the end of the screed nearest the centerline shall be controlled by a sensor activated by a ski device not less than 30 feet long. The end of the screed farthest from the centerline shall be controlled by a sensor activated by a similar apparatus or by an automatic transverse slope device set to reproduce the cross slope designated by the Engineer.

When paving contiguously with previously placed mats, the end of the screed adjacent to the previously placed mat shall be controlled by a sensor that responds to the grade of the previously placed mat and will reproduce the grade in the new mat within 0.01 ft tolerance. The end of the screed farthest from the previously placed mat shall be controlled in the same manner as when placing the initial mat.

Should the automatic screed controls fail to operate properly during any day's work, the Contractor may use manual control of the spreading equipment for the remainder of that day, however, the equipment shall be corrected or replaced with automatically controlled equipment conforming to the requirements in this section before starting another day's work.

At the discretion of the Engineer, in locations where the use of automatic screed controls with ski device is impractical or inaccessible, automatic screed controls will not be used.

Where the pavement slopes towards a concrete gutter, asphaltic concrete shall be placed such that the pavement surface is a minimum of 3/8" above the lip of gutter elevation. Where the pavement slopes away from a concrete gutter, asphaltic concrete shall be placed such that the pavement surface is flush with the lip of gutter elevation unless otherwise directed by the Engineer.



**302-5.6.2**     **Density and Smoothness**, Delete 2<sup>nd</sup> paragraph and add:

- (p. 240)     The compaction after rolling shall be between 92 and 96 percent of the maximum theoretical specific gravity as determined by ASTM D 2041. Asphalt concrete density is to be measured through the use of a nuclear density gauge, or core tests. Test locations shall be determined by random sampling techniques per California Test 375, Part C.

At least one density measurement shall be taken from each 50 tons or part thereof or for each 150 lineal feet of paving lane for each mix type placed each day. Acceptability of in-place density shall be based upon the average of at least three tests. For new pavement with a total asphaltic concrete thickness of 1-1/2 inches or more, the Engineer may require removal and replacement at Contractor's expense when the average value of the density tests is greater or less than specified in paragraph 203-6.3.3.

For evaluation of "out-of-spec" pavement materials, only cores shall be used to determine in-place density, unless otherwise approved by the Engineer. At least three cores shall be taken from the area suspected to be "out-of-spec", with at least one core taken for each 50 tons or 150 lineal feet of paving lane placed. The average of the core densities shall be used for acceptance or rejection, unless the results identify obviously defective or isolated suspicious areas. The average core density shall meet the requirements of paragraph 203-6.3.3. An individual core density of less than 90 percent shall constitute a suspicious area. The limits of isolated defective areas shall be further delineated with nuclear density gauge readings calibrated to the core data and said defective areas removed and replaced.

**302-5.7**     **Joints**, Add:

- (p. 241)     The pinched joint method of rolling is to be used for rolling all asphalt concrete joints. The roller shall be employed in a longitudinal direction on the first pass of the breakdown roll with the roller entirely on fresh asphalt and 4" to 6" from the existing asphalt or concrete.

The second pass shall be made with the roller centered longitudinally on the 4" to 6" strip. With the approval of the inspector, the 4" to 6" wide strip may be compacted on the return trip of the first pass of the roller. Remaining passes shall be in accordance with the Standard Specifications.

Asphalt concrete raking -- no asphalt concrete will be allowed to be broadcast over the finished mat solely as a means of disposing of excess aggregate. Joints will be raked or shoveled clean and excess asphalt will be disposed of by hauling away or broadcast in front of paver or placed into hopper of paver. All other raking will be in accordance with the Standard Specifications.

**302-5.8      Manholes (and other structures)**

(p. 241)      Delete first and third paragraphs and add the following:

Manhole and Valve Box Covers

Unless otherwise specified, the paving contractor will be required to adjust all manhole, valve boxes, cleanout, and monument covers.

Prior to paving, all covers shall be tied-off by the contractor in a manner that will permit determination of their exact locations after paving.

All covers shall be set 1/8" to 1/4" higher than the finish grade. The subgrade, base and pavement shall be neatly removed a distance of 12 inches from the edge of the cover. All spoils shall be removed from the site. All backfill shall be with Crushed Aggregate Base (per Section 200-2.2), compacted to 95 % relative density (per Section 211). The street section shall be replaced per Section 306-1.1.5 except a minimum of 4" of asphalt concrete will be required.

Asphalt concrete shall be placed and compacted in a minimum of two layers; a base course and a surface course a minimum of 1 1/2 inches thick.

Pre-cast concrete grade rings are required when the cover is to be adjusted 3" or more. Where manholes have been previously adjusted with steel or fiberglass rings and further adjustment is needed, the steel or fiberglass ring(s) will be removed (and delivered to the City) and replaced with pre-cast concrete grade rings.

Concrete placed to secure the cover shall be a 3250-psi mix, placed a minimum 6" thick. Concrete shall be placed to allow a minimum of 3" of asphalt concrete pavement adjacent to the cover frame and to 1" below the existing asphalt pavement at the pavement removal limits.

Concrete shall be graded and mixed to allow the mixture to fill the space between the cover frame and the pre-cast manhole components, "dry packing" will not be allowed.

**302-5.10      Seal Coat, Add:**

Type B Seal Coats

Type B seal coats shall consist of a high viscosity type emulsion (RS-2h or CRS-2h). The emulsion shall be spread at a rate not to exceed 0.30 gallons per square yard unless otherwise directed by the Engineer; the exact rate shall be determined by the Engineer. A rubber additive shall be mixed with the emulsion at no cost to the City. The additive Ultra Pave 70 manufactured by Western Division Textile Rubber and Chemical Co., Inc., or equal, shall be added to the binder at the rate of 25 gallons per 1,000 gallons of emulsion.

Additive shall be added at the job site in the presence of the Engineer. Additive shall be thoroughly mixed with the binder before being applied to the pavement.

The temperature of the emulsion prior to application shall range from a minimum of 150°F to a maximum of 190°F. Immediately following the application of the emulsion, a cover of (medium fine) screenings shall be spread. The screenings shall conform to Section 37-1.02 of the Standard Specifications, State of California. Screenings shall be of a medium gradation, 3/8" x No. 6, non-cubical in nature and spread at a rate of approximately 16 to 20 pounds per square yard, the exact rate to be determined by the Engineer.

Screenings shall be applied as close to the spray bar of the emulsion truck as possible, but not more than 50 feet behind said truck. Screenings shall be spread by a self-propelled chip spreader in accordance with Section 37-1.06 of the above-mentioned State of California Standard Specifications followed by a minimum of 3 passes with 10-ton pneumatic-tired rollers. After the first sweeping, the chip seal coat shall be immediately followed by an application of a fog seal coat. Fog seal coat shall consist of an application of a mixture of slow-setting asphaltic emulsion, SS-1h or CSS-1h, and additional water. The water shall be added and mixed with the asphaltic emulsion so that the resulting mixture will contain one part asphaltic emulsion and not more than one part added water. The rate of application shall be 0.10 to 0.13 gallons per square yard. Fog seal coat shall conform to State of California Standard Specifications Section 37. Immediately following the application of fog seal, clean concrete sand shall be applied at the rate of 1 to 3 pounds per square yard.

All excess chips shall become the property of the Contractor to dispose of beyond the limits of the public right of way.

### **303-1.7      Placing Reinforcement**

#### **303-1.7.1      General, Add:**

- (p. 257)      Reinforcing steel lists shall be submitted to the Engineer for approval when requested. Such approval is intended as additional precaution against errors and shall not be construed as relieving the Contractor of full responsibility for the accuracy of the lists.

### **303-5.1      Requirements**

#### **303-5.1.1      General, Add:**

- (p. 278)      When the plans provide for the reconstruction of a portion of an existing sidewalk, the existing section shall be cut to a minimum depth of 1-1/2 inches with an abrasive type saw at the first scoring line at or beyond the planned joint and the entire section shall be removed. The new work shall join the old work at this line.

The Engineer shall determine limits for the removal and reconstruction of curb, gutters, sidewalks, driveways, sidewalk ramps, and pavement.

Concrete coloring for sidewalks and driveways shall not be used without written permission from the Engineer.

**303-5.5.3     Walk, Add:**

- (p. 281)     When placing the tops to concrete drainage and sewer structures within the surface of the sidewalk, the tops to concrete drainage and sewer structures shall be monolithic for the full width of the curb, gutter and sidewalk. The top of the structure shall be imprinted with a Storm Drain Stencil per CVCS-24. When placing the tops of concrete drainage and sewer structures within parkways, if the distance between the edge of the structure and the sidewalk is less than 18", then the tops to said structures shall be constructed to the full width of the parkway.

**306-1.1     Trench Excavation**

**306-1.1.1     General**

- (p. 306)     Delete third paragraph and replace with the following:

The Contractor shall furnish, install, and operate such pumps, well points or other devices as may be necessary to remove any sub-surface water, seepage, storm water, or sewage that may be encountered during the construction. The trenches and other excavations shall be kept free from water while concrete or pipe is being installed. Water shall be disposed of in accordance with all Federal, State, or local agency requirements and in such a manner as to cause no injury to public or private property, nor be a menace to public health.

**306-1.2     Installation of Pipe**

**306-1.2.1     Bedding**

- (p. 308)     Delete fifth paragraph and add the following:

Except where otherwise specified, all non-reinforced and reinforced concrete pipe and all asbestos cement pipe shall be installed using the standard installation. Standard installations for reinforced concrete pipe shall consist of trench and pipe bedding as shown on Regional Standard Drawing No. D-60 except that the one-inch graded crushed aggregate rock shall extend up to the upper half (spring line) of the pipe. The remainder of the bedding material shall be sand, gravel, crushed aggregate, native free draining granular material having a sand equivalent of not less than 30 or having a coefficient of permeability greater than 1.4 inches/hour, or other material approved by the Engineer.

Except where otherwise specified, all corrugated metal pipe and all plastic pipe 18 inches inside diameter and greater shall be installed using the standard installation.

Standard installation for corrugated metal pipe and plastic pipe 18 inches inside diameter and greater shall consist of trench and pipe bedding as shown on Regional Standard Drawing No. D-60 except that the one-inch graded crushed aggregate rock shall extend up to the upper half (spring line) of the pipe. The remainder of the bedding material shall be sand.

Except where otherwise specified, all clay pipe shall be installed using "Type B rock to spring line" installation that shall consist of trench and pipe bedding as shown on Regional Standard Drawing No. S-4. The remainder of the bedding material shall be as specified above for non-reinforced and reinforced concrete pipe and asbestos cement pipe.

Except where otherwise specified, all plastic pipe with an inside diameter of less than 18 inches shall be installed using a rock envelope installation which shall consist of trench and pipe bedding as shown on Regional Standard Drawing No. S-4, Type C.

**306-1.2.2     Pipe Laying, Add:**

- (p. 309)     In order to insure a true line and grade, grade stakes shall be set every 25 feet. Sewer pipe shall be laid through the manhole unless otherwise directed by the Engineer.

When sewer pipe is to be carried continuously through the manhole, the top portion of the pipe shall be removed after all other work is completed.

**306-1.2.3     Field Jointing of Clay Pipe**

- (p. 310)     Delete first sentence and replace with:

Unless otherwise indicated on the plans, all joints for sewers constructed of clay pipe shall be type "G" joints as contained in sub-section (b) of this section.

The Contractor may submit for approval any other type of joint that he believes is equal or superior to those specified. Said alternate shall be submitted in writing at least fifteen (15) days in advance of the start of the work. The City Engineer shall be the sole judge as to whether any material submitted for approval is equal or superior to those specified. No unspecified material shall be used until approved by the City Engineer.

- (pg. 325)     Add sub-section (d) as follows:

No sewer shall be broken into except in the presence of the Engineer. The connection shall be made with a standard vitrified clay saddle constructed with lugs to prevent protrusion through the pipe. The hole in the sewer shall be made midway between joints. It shall be made with extreme care starting with as small a hole as possible and carefully enlarged so as to provide a hole approximately 1/4" larger than the outside diameter of the saddle. The saddle shall be mortared in

place, filling the annular space between saddle and pipe wall with mortar composed of 1 part Portland cement to 2 parts of clean well-graded sand. The inside shall be wiped to provide a smooth joining of the saddle to the pipe wall.

No additional pipe may be joined to the saddle until the contractor receives approval of the saddle connection from the Engineer.

After the saddle has been mortared in place and approved by the Engineer, at least 6 strands of No. 10 galvanized wire shall be loosely wound around the pipe, 3 strands on each side of the saddle, 2 of which shall pass over the saddle. A ring of Class "A" concrete at least 4 inches thick and 18 inches in length shall then be constructed entirely around the pipe at the location of the saddle.

**306-1.2.12    Field Inspection for Plastic Pipe & Fittings, Add:**

- (p. 316)    This section is also applicable to all plastic pipe and inserted liner whereby the annular space between the outer wall of the liner and inner wall of existing pipe being lined is pressure grouted.

**306-1.3.3    Jetted Backfill, Delete:**

**306-1.4.8.1    General Requirements, Delete Paragraph 6 of the Regional Supplement Amendments and replace with:**

- (p.321)    6) For underground sewer or storm drain conduit installations, the maximum operation tolerance for sag shall be 0.5 inch. No sag shall be longer than 60 feet. When televised inspection is used to check for sag, a calibrated device acceptable to the Engineer shall be used to measure the depth of sag.

**306 1.4.9    Balling of Sewers, Add:**

- (p.327)    After completion of the sanitary sewer system, including televising sewer mains and the surfacing of the street, an approved type sewer ball equal to the diameter of the pipe shall be sent through the sewer from the uppermost structure to the lowermost structure. The contractor shall, at his own expense, furnish all materials for carrying out the operation and removing any obstructions that prevent the ball from traveling through the pipe.

## **SECTION 307 - STREET LIGHTING**

**307-1.2    Regulations and Codes, Add:**

- (p. 352)    Before commencing work, the contractor shall contact the San Diego Gas & Electric Company for any requirements regarding their distribution and transmission construction methods. Work shall conform to the "SDG&E" Service guide.

**307-2.2      Foundations, Add:**

- (p. 353)      Foundations shall be installed not less than 3 feet from driveway curb opening or fire hydrants.

**307-2.3      Standard and Steel Pedestals, Add:**

- (p. 354)      Section 307-2.3.2.

**307-2.3.2      Prestressed Concrete Standards**

1)      General:

Prestressed concrete standard shall be fabricated in a manner consistent with generally accepted systems of prestressing. The standards shall be designed on the basis for wind loads of 15 pounds per square foot using a shape factor of 0.80 for all cylindrical members. A maximum tensile stress of 300 PSI will be permitted in the pole for wind loading.

Standard shall consist of a prestressed centrifugally spun, tapered concrete shaft octagonal in cross-section, a galvanized steel or aluminum luminaire bracket or mast arm, anchor rods, and associated appurtenances as shown or specified.

- 2)      A.      CEMENT - Cement shall conform to Standard Specifications for Type III Portland Cement ASTM, Designation C-150, and shall be fresh when used.
- B.      AGGREGATE - Aggregate shall be marble with a high compressive strength. It shall be uniformly graded from 1/4" to #150 mesh sieve and shall be free and clean from foreign material.

The proportion will be determined by submitting spun samples for approval by the Engineer. No dyes or artificial coloring will be acceptable.

- C.      WATER - Water shall be taken from a supply distributed for domestic purposes.
- D.      MIXING - Mixing shall be done in a mixer to achieve uniform distribution and mixing of the materials and each batch shall be mixed not less than three (3) minutes. No larger batch shall be mixed than that which can be used within thirty (30) minutes. The quantity of water used shall be limited to the smallest amount that will give concrete of such a consistency that it can readily be forced into the mold, and shall not exceed six (6) gallons to each sack of cement. Strength of concrete shall be 5000 PSI. Tests may be called for.

- E. STEEL REINFORCING - All prestressing steel used shall consist of high tensile, stress relieved, wire strand conforming to latest revised ASTM Standard A416 or other approved standards. Additional mild steel reinforcing shall consist of deformed steel bars conforming to ASTM Standard A617-76. Base plates and anchor lugs shall conform to ASTM Standard A36.

All poles shall be spirally reinforced as required to maintain spacing and provide for bursting stressed due to prestressing.

Poles shall be reinforced with four (4) or more stranded cables, the number and size of cables being dependent upon the type of standard used. Deformed bars a minimum of 30 inches long shall be welded to the base plate.

The stranded cables shall be pretensioned a maximum of 70% of their ultimate strength before casting, depending upon the type of standard used.

Stud bolts at least 12 inches long extending 2 inches above standard and bonded to cables shall be provided for top mounting arms.

- F. BONDING OF HARDWARE - All reinforcing steel, cables, deformed bars, base plates, anchor lugs, and stud bolts shall be bonded together. Mast arms shall be positively bonded to stud bolts and/or reinforcing steel and cables.

3) MANUFACTURING:

All standards shall be cast in rigid molds true to design. The steel reinforcement shall be securely anchored to the top and bottom of mold plates. Steel tension strands shall be placed to have a 3/4" minimum concrete coverage at all points.

Concrete shall be placed in mold as rapidly as possible after mixing. When filled, mold shall be placed on spinning machine in a horizontal position and rotated at a gradually increased speed until maximum rotation is attained. Time and speed of rotation shall be sufficient to produce a dense concrete. Excess water and laitance forced to the center of the mass shall be drained in a suitable manner. A central opening or duct, minimum diameter of 1", shall be formed throughout the length of the pole or as shown on drawings and shall be free from sharp projections or edges of a character which might injure the wire or cable. The base shall be cored to dimensions shown on the standard drawings and access into base shall be provided by door opening as detailed on drawings.



4) CURING:

The standard shall be moist steam cured until the concrete has attained a set sufficiently hard to prevent its deformation or slipping of cable strands. Steam curing shall be controlled so there will be no deformation of the pole center core. Upon removal of the standard from the mold, it shall be protected from the direct action of sun and wind for a period of forty-eight (48) hours. If not steam cured, it shall be kept wet by continuous spraying with water or be covered with heavy burlap or other suitable material that is kept saturated with water during the curing period of seventy-two (72) hours. An additional period of fifteen (15) days shall be allowed for curing in air before standards are delivered for installation.

5) FINISHING:

After the standards have been sufficiently cured, the entire outside surface of the standards shall be sandblasted to remove cement laitance and develop the surface texture, care being taken that the true lines of the standards are maintained. The standards when finished shall be without cracks or crazing and shall have a uniform surface and texture throughout the entire length.

The finished standard shall be coated with an anti-graffiti coating. The coating shall be the Repello-Protective Surface System as manufactured by the L.M. Schofield Company or an approved equal. Three coats of the anti-graffiti coating shall be applied to the light standard.

6) LUMINAIRE BRACKET:

Standards shall be furnished with a bracket or pole mounting conforming to design and dimensions shown on plan. A minimum of 5 inches straight portion shall be provided to mount a 2-inch slipfitter type luminaire. The interior shall be free of sharp edges or projections. Steel arms shall be made of pipe conforming to ASTM Designation A120-47. Aluminum arms shall be made of 6-63-T6 aluminum pipe. Steel brackets shall be hot dipped galvanized. Aluminum brackets shall be furnished with no finish.

7) POLE TOP:

The pole top shall be cast from #214 aluminum alloy. The cover shall be secured to the pole top or bracket by a minimum of two screws.

8) ANCHOR RODS:

Four anchor rods 3/4" or 1" nominal diameter by 36"x4" shall be furnished. The lower end of the rod shall be formed to produce an ell (L) bend. The upper end shall be threaded a minimum of 6" and fitted with two hex nuts per rod. Rod and nuts shall be hot dipped galvanized to ASTM Designation A153-49.

9) MISCELLANEOUS:

All miscellaneous hardware shall be cadmium coated, hot dipped galvanized, or of stainless steel.

10) DESIGN DRAWINGS, SAMPLES, AND GUARANTEE:

The supplier, upon request, shall submit for the approval of the Engineer prior to fabrication, drawings of the standards proposed to be furnished. Such drawings shall be accompanied by design criteria and detailed specifications of materials proposed to be incorporated into the standards. The drawings shall also include details concerning the method of prestressing and fastening of steel to provide the proper residual compressive force in the concrete. The supplier shall also submit as a part of the required drawings the design of the concrete mix proposed to be used. Prior to approval, the Engineer may require the supplier to deliver to the City a standard for test and evaluation.

The supplier shall provide facilities for the Engineer to select samples of any of the materials proposed to be used and shall also provide facilities for the inspection of all molds, materials, manufacturing and assembly of the standards.

The supplier shall guarantee the City for a period of five (5) years from the date of acceptance, the standards against defective workmanship and materials which would cause cracking and/or spalling or any other defects requiring maintenance of the pole finish or replacement of the pole. When notified by the Engineer, the supplier or his sureties shall promptly replace or repair the defective standard or standards in a manner satisfactory to the Engineer. If the supplier or his sureties fail to promptly make the replacement or repair, the City may perform the work and the supplier and his sureties shall be liable for the cost of all such work. Failure of the supplier or his sureties to comply with the terms of this section may disqualify the supplier for any future City work.

**307-2.8** Service

(p. 358) Section 307-2.8 is amended to read:

Where the service point is a utility-owned pole, the Contractor shall furnish conduit and all other necessary material to complete the installation of the service riser. If the Contractor is required by the plans or special provisions to install the service riser and equipment on a utility-owned pole, the position of the riser and equipment will be determined by the utility.

The contractor shall make arrangements with the San Diego Gas & Electric Company and shall pay all fees necessary to complete the connection of the service

point. Metering installation will be furnished by San Diego Gas & Electric Company.

Full compensation for furnishing and installing service poles, service equipment, conduit, and conductors (including equipment, conduit, and conductors placed on utility-owned poles, and the additional conductor where the service utility requires 3-wire, 120/240-volt service into the meter socket for a 120-volt load), and for any service connection fees, shall be considered as included in the contract item of electrical work involved and no additional compensation will be allowed therefor."

Upon request by the Contractor, the Engineer will arrange for furnishing electrical energy. Energy used prior to final acceptance will be charged to the Contractor, except that the cost of energy used for public benefit, when such operation is ordered by the Engineer, will be at the expense of the City.

**400-2.1.1     Requirements**

(p. 398)     Revise section to read:

When base material without further qualification is specified the contractor shall supply Crushed Aggregate Base.

